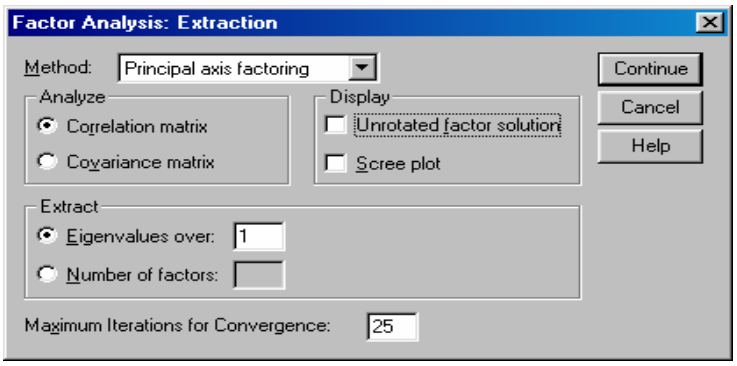
Common Factors



Use the "Extraction" window to request a common factoring.

All other commands work as they did with component analyses.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.048	38.097	38.097	3.048	38.097	38.097	2.304	28.798	28.798
2	1.709	21.363	59.459	1.709	21.363	59.459	2.093	26.163	54.961
3	1.340	16.746	76.205	1.340	16.746	76.205	1.699	21.244	76.205
4	.636	7.953	84.158						
5	.483	6.036	90.194						
6	.340	4.244	94.438						
7	.240	3.000	97.438						
8	.205	2.562	100.000						

Extraction Method: Principal Component Analysis.

Communalities

	Initial	Extraction
physical aggression	1.000	.746
property damage	1.000	.759
theft	1.000	.603
extreme verbal abuse	1.000	.742
sad	1.000	.747
anxious	1.000	.797
self-confidence	1.000	.861
compliance	1.000	.843

Extraction Method: Principal Component Analysis

Above is the output from a PC with varimax rotation

- Notice that the variance accounted for by the initial and extracted solution and by the rotated solution (varimax) are all the same

Below is the output from a PAF with varimax rotation

- Notice that the extracted and rotated solution variances are equal to each other and both are less than that of the initial solution
- The initial solution is a PC → the $\lambda>1$ rule determines the starting communalities and the number of common factors to be extracted
- The extracted and rotation solutions are both common factor solutions, so the "variance accounted for" refers to common variance -- there's always less common variance than total variance
- Notice also that the communalities from the PAF are smaller than from the PC -- same reason …
- The communalities of a PC refer to the % of the total variance of that variable accounted for by the PC solution, while the communalities of a PAF refer to the % of the common variance of that variable accounted or by the PAF solution → common < total

Communalities

	Initial	Extraction
physical aggression	.620	.680
property damage	.597	.727
theft	.265	.305
extreme verbal abuse	.587	.644
sad	.472	.498
anxious	.569	.790
self-confidence	.484	.604
compliance	.555	.805

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.048	38.097	38.097	2.725	34.059	34.059	1.911	23.882	23.882
2	1.709	21.363	59.459	1.312	16.399	50.458	1.738	21.730	45.612
3	1.340	16.746	76.205	1.017	12.711	63.169	1.405	17.556	63.169
4	.636	7.953	84.158						
5	.483	6.036	90.194						
6	.340	4.244	94.438						
7	.240	3.000	97.438						
8	.205	2.562	100.000						

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.048	38.097	38.097	2.733	34.165	34.165	2.005
2	1.709	21.363	59.459	1.315	16.443	50.608	2.057
3	1.340	16.746	76.205	1.023	12.788	63.396	1.630
4	.636	7.953	84.158				
5	.483	6.036	90.194				
6	.340	4.244	94.438				
7	.240	3.000	97.438				
8	.205	2.562	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Communalities

	Initial	Extraction
physical aggression	.620	.680
property damage	.597	.727
theft	.265	.305
extreme verbal abuse	.587	.644
sad	.472	.498
anxious	.569	.790
self-confidence	.484	.604
compliance	.555	.805

Extraction Method: Principal Axis Factoring.

Here's a PAF with a direct oblimin rotation…

The initial and extraction variance are the same as the PAF above, as are the communalities.

Notice the "a" footnote -- reminding us that, for an oblique solution, the sum of the factor variances doesn't equal the overall variance accounted for

You can compute the variance accounted for by each rotated factor as λ / k. For this solution these are…

25.06% + 25.71& + 20.38% = 71.15% > 63.396%

Remember that these refer to % of common variance